Course code and name: ISYS1118 Software Engineering Fundamentals

Assessment name: UML Design

Assessment Type: Individual

Submission Type: Written report and code submission

Report Length: Less than or equal to 6 pages (but not more than 6 pages)

Grading Rubric: Included (added at the end of the specifications)

Learning Objectives Assessed

This assessment evaluates the following CLOs:

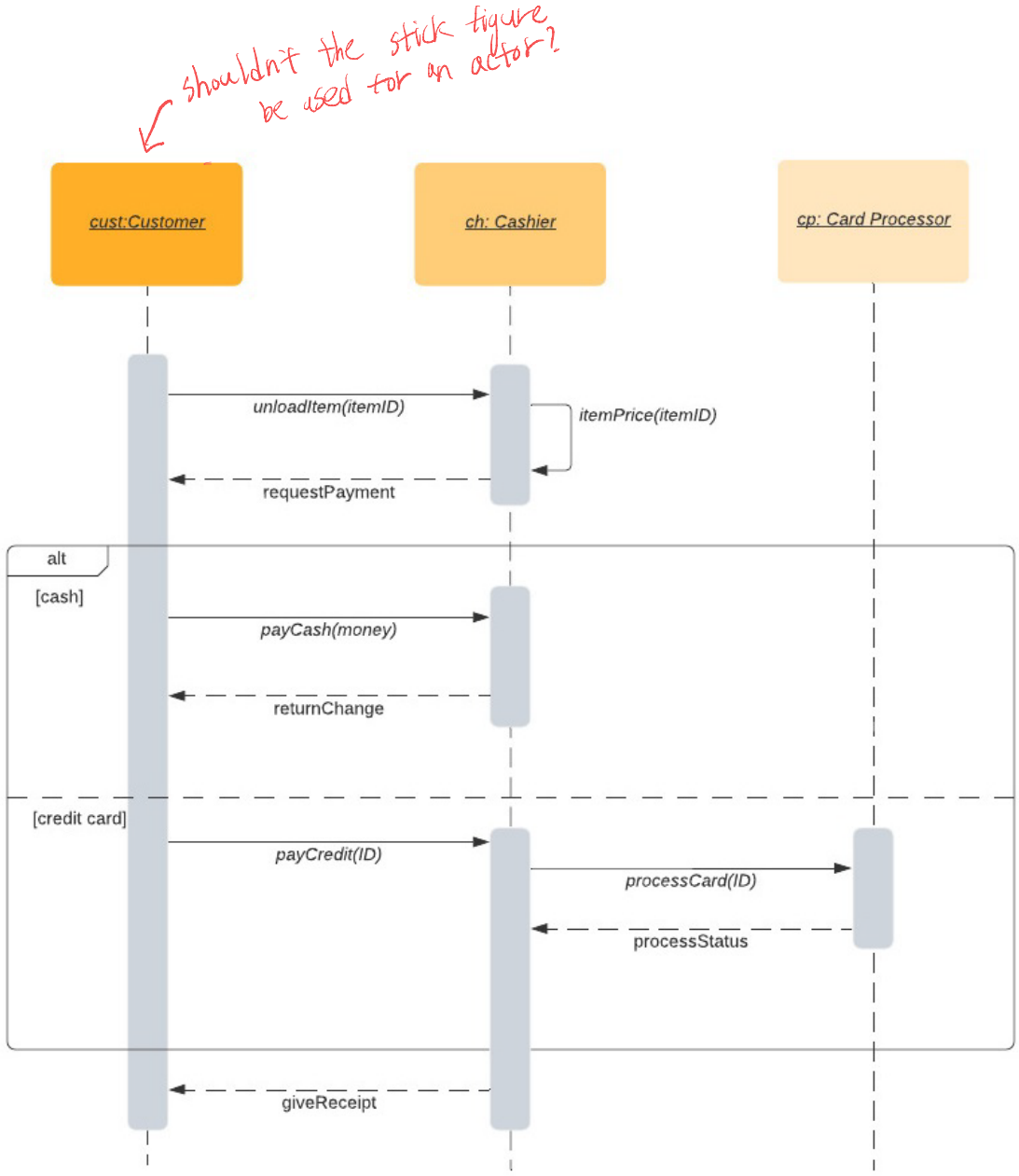
- CLO 1: explain and apply the main aspects of software engineering
- CLO 2: evaluate requirements for a software system
- CLO 3: apply the process of analysis and design using the object-oriented approach.
- CLO 6: recognise and describe current trends in the area of software engineering

Assessment Details

This assignment evaluates object-oriented structural and behavioural design in terms of class diagrams, sequence diagrams and matching code. You will be required to create class diagram, sequence diagrams and write corresponding code. You need to complete provided activities 1-3. You will answer critical-thinking questions regarding your design decisions, and you will have to explain them.

Note: You can make any assumption when responding to the activities in this assignment, but this assumption should be explicitly mentioned in the report

You are given the following Sequence Diagram.



Note: You can save a copy of the given diagram using the following URL https://lucid.app/documents/view/d98915d4-3edc-4cf5-beb2-7f0d4fb0f4ac. You can use any other tool if you want to recreate the sequence diagram for activity 2

Activity 1

There is a requirement to create a new employee categorized as manager. This addition is due to the following reasons

- A customer can make complaints to the manager.
- Manager pays salary to the cashier
- Manager looks after the inventory of the store

Mention all the changes that should be made to the given sequence diagram to address this new requirement. Justify these changes (there could be multiple solutions to address this requirement, please explain the reason behind your solution). Clearly state all the assumptions and create a new sequence diagram that addresses this new requirement (mentioned in this activity) **Note:** You can either modify the given sequence diagram or create multiple sequence diagrams based on your solution

Activity 2

First, create a class diagram after completing **activity 1**. Then transform the created class diagram into java code. You can make assumptions while implementing classes (these assumptions should be consistent with activities 1-2- sequence and class diagrams). The java code should just represent the behavior and structure reported in the sequence and class diagrams respectively. Keep the function implementation simple (maybe returning or printing a string variable that represents the respective part of the sequence diagram), complicated function implementations are not part of the assignment. The sequence diagram could be implemented in 3 or more functions/methods, which should be accompanied by comments to describe which part of the sequence diagrams is represented by the code. Create a main class for instantiating the classes and run all the methods described in your solution of **activity 1**. Please note that the code ending in errors will be penalized. Add comments to the code to explain the mapping from class and sequence diagrams to code, code without comments will be penalized.

Activity 3

Which software architecture would you recommend for the above scenario? Provide details to justify your recommendation. You may include figures to support your answer

Submission Guide:

- Create a folder whose name should be your student ID. **Note:** Your folder name should not contain any other words, letters, or numbers, it should just be named after your student ID (e.g. S123456). Not following the given specification will result in marks deduction
- Within the folder, copy the folder containing your java code (the code should be clean, it should not contain other irrelevant files) and your report. This folder and report should again be named after your student ID
- Your code should be accompanied by a “ReadMe” file explaining the files within the code and instructions on how to run the code (if one needs to adjust any setting that is necessary to run the code).
- Compress the folder and upload it to canvas
- Violating the submission guide (e.g. not naming the folder after your student ID) will end in marks deduction

Late work:

Unless special consideration has been granted, the late penalty is 10% of the total mark for the assessment per day late for up to 5 days late (so the maximum late penalty is 50%). Submissions more than 5 days late are not accepted.

Rubric

Criteria	Ratings					Pts
Activity 1	**10 to >8 Pts** **HIGH DISTINCTION** The new requirement is correctly added to the sequence diagram and is error-free and complete. The rationale of the mentioned changes is correct and complete. Any assumptions made are clearly reported and are logical. The sequence diagram is complete and correct (error-free). The report is of high quality (easy to understand with no grammatical mistakes and typos). Professional and consistent use of UML syntax.	**8 to >7.0 Pts** **DISTINCTION** The new requirement is correctly added to the sequence diagram and largely is error-free and complete. The rationale of the mentioned changes is correct and complete. Any assumptions made are clearly reported and logical. The sequence diagram is largely complete and correct (minor errors). Professional and consistent use of UML syntax	**7 to >6.0 Pts** **Credit** The new requirement is correctly added to the sequence diagram and somewhat is error-free and complete. Any reported assumptions made are somewhat clear and logical. The sequence diagram is somewhat complete and correct (a few errors). Largely professional and consistent use of UML syntax.	**6 to >5.0 Pts** **Pass** The new requirement is added to the sequence diagram has minor error and somewhat complete. Any assumptions made are not clearly stated or are ambiguous. The sequence diagram is somewhat complete and correct, with many minor errors. The use of UML is somewhat professional and consistent.	**5 to >0 Pts** **Fail** The new requirement added to the sequence diagram is incorrect and incomplete. The sequence diagram is not clear and difficult to understand. Any assumptions made were not reported. The class diagram is incorrect or incomplete. The use of UML is not professional and consistent.	10 pts
Activity 2	**12 to >10.5 Pts** **HIGH DISTINCTION** The class diagram is complete and correct (error-free). Professional and consistent use of UML syntax. Any assumptions made are clearly reported and are logical. Indicates a clear understanding of UML and converting it to code. Reported code is of high quality (comments added, easy to understand/follow and clean code). The code is error-free and complete. It correctly represents the behaviour of the provided system in the sequence diagram and class diagram.	**10.5 to >8.5 Pts** **DISTINCTION** The class diagram is largely complete and correct (minor errors). Professional and consistent use of UML syntax. Any assumptions made are clearly reported and are logical. Indicates a clear understanding of UML and converting it to code. The quality of reported code is good (comments added, easy to understand/follow and clean code). The code is largely error-free and complete. It correctly represents the behaviour of the provided system in the sequence diagram and class diagram.	**8.5 to >7.5 Pts** **Credit** The class diagram is somewhat complete and correct (a few errors). Largely professional and consistent use of UML syntax. Any assumptions made are somewhat clear and logical. Largely clear about UML and its conversion into code. The quality of reported code is largely good (comments added, somewhat easy to understand/follow and clean code). The code has minor errors but is complete. It correctly	**7.5 to >6.0 Pts** **Pass** The class diagram is somewhat complete and correct, with many minor errors. The use of UML is somewhat professional and consistent. Any assumptions made are not clearly stated or are ambiguous. Somewhat confused about UML and its conversion into code. The quality of the reported code is fine (fewer comments and somewhat clean code). The code has a few errors and somewhat complete has a few	**6 to >0 Pts** **Fail** The class diagram is incorrect or incomplete. The use of UML is not professional and consistent. The diagram is not clear and difficult to understand as the assumption is not clearly stated. Major issues with the UML concept and its conversion into code. The quality of the reported code is poor. The code has many errors and is incomplete. It incorrectly represents the behaviour of the provided system in the	12 pts

			represents the behaviour of the provided system in the sequence diagram and class diagram.	mistakes in representing the behaviour of the provided system in the sequence diagram and class diagram.	sequence diagram and class diagram.	
Activity 3	**3 to >2.4 Pts** **HIGH DISTINCTION** The reason for software architecture selection is entirely logical and complete. The response is easy to follow and explained in detail. The formatting of the response is professional and error-free	**2.4 to >2.1 Pts** **DISTINCTION** The reason for software architecture selection is largely logical and complete. The response is easy to follow and explained in detail. The formatting of the response is professional and largely error-free	**2.1 to >1.8 Pts** **Credit** The reason for software architecture selection is somewhat logical and complete. The explanation could have been explained in more detail. The formatting of the response is professional and somewhat error-free	**1.8 to >1.5 Pts** **Pass** The reason for software process selection has minor logical errors. It is a bit difficult to understand the response. The explanation could have been explained in more detail. The formatting of the response is somewhat professional with a few errors	**1.5 to >0 Pts** **Fail** The reason for software process selection is incorrect, incomplete or not explained. The response is difficult to understand. The formatting of the response is unprofessional with major errors	3 pts